

## 4.14 Solving Exponential & Logarithmic Equations

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**Review: Solve the given equations. Show all work!**

1.  $x^2 - 7x - 30 = 0$

2.  $(x+3)^2 - 4(x+3) + 3 = 0$

**Solve each logarithmic equation. Express irrational solutions in exact form and as a decimal rounded to three decimal places. Show all work!**

3.  $\log_4 x = 2$

4.  $\log_4(x+2) = \log_4 8$

5.  $\frac{1}{2}\log_3 x = 2\log_3 2$

6.  $2\log_3(x+4) - \log_3 9 = 2$

7.  $\log x + \log(x+15) = 2$

8.  $\log_2(x+7) + \log_2(x+8) = 1$

9.  $\log_5(x+3) = 1 - \log_5(x-1)$

10.  $\ln x + \ln(x+2) = 4$

**Solve each exponential equation. Express irrational solutions in exact form and as a decimal rounded to three decimal places. Show work!**

11.  $2^{x-5} = 8$

12.  $8^{-x} = 1.2$

13.  $3^{1-2x} = 4^x$

14.  $\left(\frac{3}{5}\right)^x = 7^{1-x}$

15.  $3^{2x} + 3^x - 2 = 0$

16.  $2^{2x} + 2^x - 12 = 0$

17.  $\frac{e^x + e^{-x}}{2} = 0$  (Hint: Multiply both sides of the equation by  $e^x$ .)

18. The value of a Honda Civic DX that is  $t$  years old can be modeled by  $V(t) = 16,775(0.905)^t$ .

According to the model, when will the car be worth \$15,000? \$8,000? \$4,000? Show work!